




IDAHO SPRINGS



"THE DOME OF THE CONTINENT."

Its Mines and Mineral Waters.



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IDAHO SPRINGS;

ITS MINES

—AND—

MINERAL WATERS.



GEORGETOWN, COLORADO :
GEORGETOWN COURIER STEAM PRINTING HOUSE AND BLANK BOOK MANUFACTORY
1880.

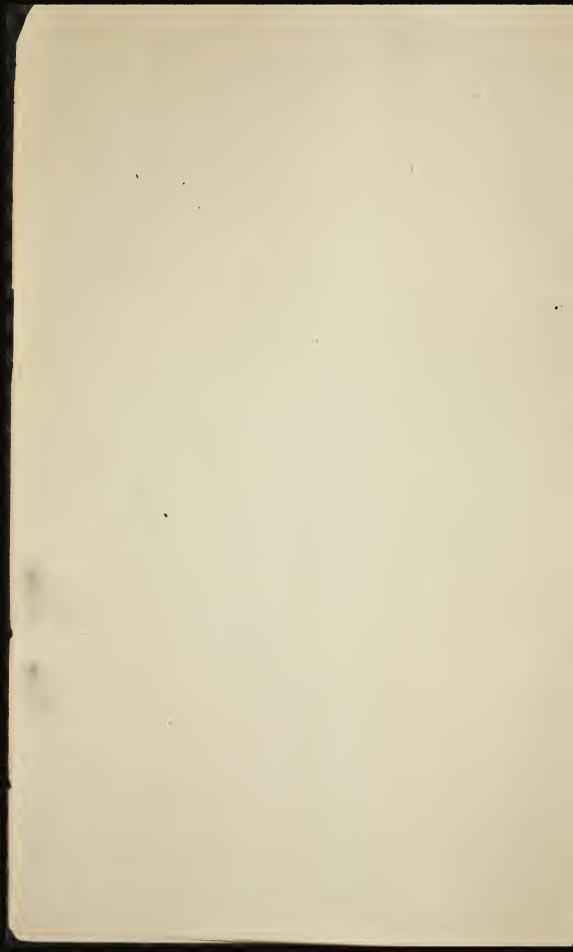


PREFACE.

THIS PAMPHLET, as its name indicates, is devoted to a general description of the scenic, mineral and hygienic attractions of IDAHO SPRINGS, Clear Creek County, Colorado. The growing importance of the hot and cold mineral waters, which have already rendered this place famous as a summer resort for tourists and invalids; together with the unusual interest of late manifested in the gold- and silver-bearing lodes of this district—which offers more than ordinary inducements to parties in search of health, pleasure and opportunities for the profitable investment of capital—renders a work of this nature of undoubted interest to the reading and traveling public. A class of information not usually found in the general news, is herein furnished, and the author trusts that the acceptance of the work will be proportionate to the importance of the subject.

AARON FROST.

IDAHO SPRINGS, June 1st, 1880.



IDAHO SPRINGS.

LOCATION AND HISTORY.

SITUATED in the valley of South Clear Creek, thirty-five miles west of Denver and fourteen miles easterly from Georgetown, the county seat of Clear Creek County, lies the lovely mountain town which is the subject of this sketch. Thus far, the visitor approaching the place from Denver, *via* the Colorado Central railroad, has been treated to a succession of frowning precipices; austere mountain slopes dotted here and there with pines; narrow defiles where every inch of territory claimed by the snorting iron steed was disputed by the raging torrent that forever rolls down the canon, and, occasionally, to a glimpse of some grand old mountain peak that towers haughtily over its less lofty rivals. At Idaho Springs, however, there is a decidedly agreeable change. The mountains are less rugged and the riotous confusion of barren crags is replaced by pine-decked slopes, carpeted with grass and bearing an infinite variety of flowers. The stream is no longer a torrent, but glides through the town in the most peaceable and orthodox manner, and the gulch widens out at the risk of losing its claim to the well-known appellation, "Clear Creek Canon."

Immediately north of the town is the foot of Virginia canon, through which a wagon-road, following the sinuosities of the gulch, leads to Central, a distance of six somewhat attenuated miles. This affords one of the most delightful drives imaginable, and the head of the canon, looking south, presents to view a singular amphitheater of mountains of an endless diversity of shapes, conspicuous among which are the Old Chief, Squaw and Pappoose. South of the town Soda and Chicago Creeks debouch into Clear Creek, their points of confluence being about half a mile apart.

The little park where Idaho stands is one-and-a-half miles in length, ranging east and west, and less than half a mile in width. The ground is slightly undulating, and the creek, with commendable consideration for one of the prime necessities of

the town—a place to stand on—closely hugs the base of Flirtation Peak, insuring the greatest economy in bridges and building lots. The pines that dotted the valley in its primeval wildness were ruthlessly slaughtered by the early settlers, so that but few remain. It is gratifying to note, however, that the very hands that cut down from motives of utility have generously planted with a desire to beautify; and they have been eminently successful, whispering colonnades of aspens lending a refreshing verdancy to the principal streets.

Let us commence at the commencement and trace the progress of the town from the first log cabin that sheltered the pioneers of civilization up to the "Saratoga of the West" that nestles proudly in the valley to-day. It was during the spring of 1859, twenty-one years ago, that a small party of gold-seekers, headed by George A. Jackson, laid the foundation of Idaho Springs. The first gulching was commenced on Chicago bar, now within the town limits, and the fact that they were deservedly successful soon attracted others who were thirsting for gold and adventure; so that when the mountain maples shed their russet leaves in the fall, at least two hundred prospectors were on the spot. Many of them remained during the winter, and in the summer of 1860 Idaho was an established fact. During that year Dennis Faivre, now one of Idaho's most popular and successful merchants, occasionally drove a team of oxen, laden with miners' supplies, into the incipient camp. It was then, also, that an unpretentious log cabin commenced to cater to the gastronomic necessities of the gold miners under the direction of F. W. Beebee and the cognomen of the Beebee House. That was the foundation of the Beebee House of to-day, and through all the intervening vicissitudes of fortune and the ups and downs of the town he has stood tenaciously at the helm and acquired a reputation in this line second to none in the State. Indeed, tenacity was a notable feature among the early pioneers of this place. Among the 59-ers who are still residents of the town may be mentioned A. P. Smith, William Hobbs and John Needham.

In 1860 Dr. A. M. Noxon, Dr. E. F. Holland, M. B. Graeff, John Silvertooth, "Elder" R. B. Griswold, and a number of others who still remain here, first migrated to the nascent camp. In the same year was the first increase of population not due to immigration, and the first celebration of Independence Day in the county. On the latter occasion about one hundred miners marched proudly in procession to the mellifluous strains of a single fife, carrying the insignia of their rank—their picks and shovels—on their shoulders. It is claimed that this patriotic display was entirely free from the stimulating influence of whiskey. There is a lingering suspicion in the minds of many, however, that this unusual abstinence on the part of the enthusiastic

miners might possibly be due to an unavoidable scarcity of the article.

In '61, Clear Creek Canon, from Spanish Bar, two miles above Idaho, to Floyd Hill, six miles below, was alive with gold-seekers, and "Clear" Creek became a misnomer applied to the stream that was completely polluted by gulch mining. At this time female society began to exert its refining influence on the rude but generous miners. Religious services, conducted alternately by a divine named Bunch, *alias* "Arkansas Traveler," and the Rev. — Potts, were of weekly occurrence, but the decorum exacted at the present day was not always observed. At one time a number of miners were carrying a deceased comrade to his final resting-place, and left the remains in the street for a short time while they irrigated at a saloon-grocery combination; and when at length they arrived at the burial ground, in the absence of any orthodox ritual, they lustily sang "Old Rosin the Bow" over their dead "pard," and departed with the consciousness of the faithful performance of their duty.

In the same year the Seaton mine was discovered and the first stamp mill erected. The Whale lode was located at this time—the Hukill having been discovered a year previous—and the attention of many of the gulch miners was diverted to lode mining. In this year the Territorial government was organized and Idaho Springs became the county seat of Clear Creek county, but in '67 this distinction was transferred to Georgetown. In the interim the gulch miners worked along in a rudely felicitous way, and many stories are told at the present day of the unpolished manliness and native generosity of the early pioneers, who traded solely through the medium of gold dust, and attended church in indifferent attire.

In '65 the first discovery of silver occurred. In consequence the county was wild with excitement and an unusual wave of prosperity, extending over a period of several years, was the result. With the discovery of silver the decadence of gulch mining commenced, and although it is still prosecuted in a limited way, the annual returns are not a tithe of what they once were.

In '66 Mr. Harrison Montague took charge of and commenced to improve the hot soda springs, which soon became renowned for their curative properties, and since that time hundreds of tourists have been annually attracted to Idaho by this feature alone, to which a subsequent chapter is entirely devoted.

During the '70s a number of adjacent veins were steadily developed, and lode mining became a profitable industry. Mills were built and wagon roads constructed, and the pioneers began to reap the reward of their perseverance.

In the fall of '73 a government patent was obtained for the town site, and a board of trustees organized with "Elder" Gris-

would at its head. In the spring of '79, the town and the surrounding district commenced to take uncommonly rapid and effective strides in the march of progress. Idaho now possessed railroad facilities, great advances had been made in the treatment of its ores, and many of the disadvantages which had militated somewhat against the prosperity of the camp at an early day were partially or entirely removed. Capitalists cast significant glances at its immense mineral veins, and among the first to recognize their importance was a party of Nevada gentlemen. The result was that two of the most valuable lodes in the vicinity, the Freeland and the Hukill, were purchased, and mining was commenced on a scale hitherto unknown in this county. Now that the way was so clearly pointed out, other men possessed of means soon followed, and mining investment and development became general. Residences with claims to considerable architectural beauty were speedily erected, and to-day Idaho Springs is one of the neatest and most pleasant and progressive mountain towns in the State.

SOCIAL AND COMMERCIAL FEATURES.

No more desirable point than Idaho can be found for the erection of concentrating and reduction works. The milling facilities, however, are quite insignificant, compared with the possibilities. Contiguous forests furnish an abundance of timber, and the water power of the different streams is practically unlimited.

Idaho possesses one stamp mill—the Specie Payment—one concentrating mill—the Collom—which is running steadily, principally on Freeland ore, and the New York and Colorado reduction works, owned by Joseph K. Wells, of New York, and superintended by Odell Wilson, James Wells being the secretary and treasurer. The hot brine process is used for the extraction of the gold and silver. The capacity of the works has recently been increased, and they are now steadily crushing, stamping and reducing to bullion the ores of this district. In addition to these there are the Miles concentrating works, which do as good work as any in the county. These works all claim the attention of visitors to Idaho.

Two saw mills, owned by Henry Wilson, are in operation; also, a brick yard, owned by Col. Wm. Moore and F. M. Crosson; but these are insufficient to meet the present demand for building material.

At present the only hotel where the tourist can find a nice

room and good board, is the Beebee House, which has gained an enviable reputation as a first-class house, under the management of the proprietor, F. W. Beebee, and is the headquarters of the mining men of the vicinity. A number of summer cottages are being erected by Mr. Beebee, and others, to meet the rapidly increasing demand for accommodations. A large hotel is also in course of construction, and a number of good boarding houses now cater to the public. A new lot of fine saddle horses has been recently received by Henry Plummer, the popular livery man of the place, who also keeps some splendid driving teams and carriages. In addition to this, John H. Taylor keeps a stable, which is well patronized.

I. N. Smith, Esq., one of the clearest headed lawyers in the county, has been located in Idaho Springs for several years and his thorough acquaintance with the location and title of every piece of property in the vicinity commends him to those having any business requiring a thorough knowledge of the intricacies of mining laws. Hon. Thomas B. Bryan, recently elected Mayor of the city, and his son, Charles P., are lawyers of excellent ability and reputation. Mr. Jesse Gillmore is a recent acquisition to the profession here, having resided in Idaho Springs about a year. Mr. Gillmore has paid more attention to the mines of the district than to the practice of law. Probably no one in the place is better informed on this topic, unless we except Judge George L. Cannon, who for the past eight years has made the mines of this district a study, and during that time has filled his office with a fine collection of minerals. Mr. Cannon is the agent for a number of eastern mining companies, for which his large experience in this business eminently qualifies him.

The medical profession is represented by Drs. A. M. Noxon, Eugene F. Holland, J. H. Lowry, S. P. Merkel and E. A. Ashmore. Dr. Noxon is one of those out-spoken, whole-souled men, who always make friends wherever they go. He is interested in several valuable mining properties which occupy most of his time. Dr. Holland is an old resident and has many friends. Dr. Lowry is a homœopathist and has a good practice. Drs. Ashmore and Merkel are recent arrivals, but we are assured that they are men of experience and ability.

The place is well supplied with business houses of all kinds. Dennis Faivre, one of the most popular and substantial men of the place, is the veteran grocer and carries a large and well selected stock of goods. The Patten Brothers, C. A. & A. E., have a good trade in the same business. George A. Patten has been for many years the leading dry goods merchant, and is as popular as ever. Ellis & Deemer have one of the best appointed meat markets in the county. Messrs. Horn & Erickson, the former of whom occupies the position of postmaster, keep a

full stock of stationery, pictures, frames, fancy goods, etc. Knoettge & Hardy have refitted their store, and now have a large and well selected stock of drugs and toilet articles.

Several well appointed billiard halls afford opportunities of amusement for those who love to handle the cue, Mr. J. H. Warner's parlor being the favorite resort. It is elegantly furnished and supplied with four first-class tables. In a side room will be found a choice assortment of wines and liquors. M. J. McKinley's room is a pleasant place, furnished with one good table and a good supply of something damp for the stomach's sake. Similar accommodations can be found at C. H. Skinner's billiard parlor. Jacob Bloom always keeps an abundance of California fruits, confectionery and cigars. J. J. Elliott does the assaying for the place and is kept busy. The jeweler, Mr. S. Thackara, is a genius, and can make anything from the lynch-pin of a two-dollar oroid to the detent of the finest English chronometer, or the repairing and adjustment of the most delicate mathematical instrument. Mr. Ira Hutchinson keeps everything found in a first-class bakery and sets out some of the nicest lunches imaginable.

At the last election it was decided that water works should be introduced, which will greatly increase the efficiency of the fire department.

A weekly, seven-column paper, "The Idaho Springs *Iris*," is published by Mr. E. A. Benedict.

From the old log school house of "California Rancho," has evolved the present commodious school building, well supplied with apparatus for teaching. There are four religious societies in the place, the Episcopal, Methodist, Roman Catholic and Presbyterian. Rev. Mr. Jones is rector of the Episcopal, Rev. J. F. White pastor of the M. E., and Rev. J. S. Caruthers, of the Presbyterian Church. Father Matz, of Georgetown, holds services every two weeks at the Catholic Church.

Idaho Springs has improved more rapidly within the past year than for several years previous, and now has a population of about 1,200. Building is very active, F. X. Fitzpatrick and John Thexton contracting for most of it.

The society of the place is excellent, composed as it is of tourists, capitalists, and the agents and superintendents of mining companies, in addition to the old residents who have contributed so much to the substantial prosperity of the place.

The "Pavilion," a circular building in the central part of the town, is highly convenient for dances and other social gatherings, and is used entirely for this purpose.

Idaho has one of the finest hook and ladder companies in the State. Mr. J. H. Warner is chief of the department, and Mr. M. J. McKinley is the assistant chief. The efficiency of the company has been thoroughly tested on several occasions.

THE MINERAL SPRINGS.

The hot springs, which for years have been the sheet anchor of Idaho Springs, are of the alkaline-sulphur class. There are six in number, all located on the banks of Soda Creek, within a short distance of its confluence with Clear Creek, and but a few minutes' walk from the Beebee House. They were discovered as early as 1860, though, apart from being used for the ped-al ablutions of the gold miners, but little attention was paid to them for a number of years. In 1863, Dr. E. S. Cummings erected a small bath house and retained possession of the springs property until '66, at which time it passed into the hands of its present owner, Mr. H. Montague.

The bathing accommodations at this date consist of two swimming baths—the Mammoth and the Ocean—and seven private or tub baths, fitted up with shower baths and all necessary appurtenances. The Mammoth is 30x50 feet in size and five feet deep, and the Ocean is 20x40 feet and four feet deep. The different springs vary in temperature from 75 to 120 degrees, and the supply of water is sufficient for ten times the present number of baths. Carbonate of soda and sulphate of soda are the predominant minerals held in solution, as will be seen by the following table of the chemical constituents contained in a gallon of water :

	Grains.
Carbonate of Soda.....	30.80
Carbonate of Lime.....	9.52
Carbonate of Magnesia.....	2.80
Carbonate of Iron.....	4.12
Sulphate of Soda.....	29.36
Sulphate of Magnesia.....	18.72
Sulphate of Lime.....	3.44
Chloride of Sodium.....	4.16
Silicate of Soda.....	4.08
Chlorides of Calcium and Magnesium, of each a trace.	
	107.00

The above analysis was made by J. G. Pohle, analytical chemist, who says "Waters of this alkaline class occasionally contain iodine and bromine, but the small amount of water at my disposal prevented me from making an examination for these substances. The medicinal characteristics of this spring are antacid, alterative, and in many cases slightly laxative. Its external use as a bath will be found beneficial in cases of rheumatism and diseases of the skin."

Throughout all ages the medicinal virtues of natural mineral waters have been universally admitted, though the most careful research of analytic science has often failed to produce an artificial solution possessing the peculiar curative properties of the water which it attempted to imitate. Trousseau, the celebrated

French physician, in discussing this subject, says: "Whatever may be said of them, mineral waters are not simple medicaments; whatever may be the predominant mineralizing agent, as demonstrated by analysis, it acts not alone. Nature, in combining with the more or less notable elements which chemistry may isolate other exceedingly valuable ingredients and principles, which have not yet been discovered, has done for this mineralized agent that which we seek to imitate each day in our prescriptions, when we endeavor to re-enforce or diminish the effect of a medical substance by associating others with it."

The most exhaustive and scientific work on the mineral springs of the United States was compiled during the last decade by Geo. E. Walton, an eminent physician of Cincinnati. It is therein stated, as a rule to be remembered, that mineral waters are only applicable to the treatment of chronic diseases. A review of the work points to the conclusion that waters of this class are of direct benefit in cases of enlarged liver, renal and biliary calculi, gastritis, gastric ulcers, constipation, eczema, etc. A special mention, in the same work, of the springs of Idaho, says: "They are valuable waters—especially useful in rheumatism, cutaneous diseases, contraction of joints, etc."

Of the value of these mineral waters in rheumatic affections, we are furnished with indisputable local testimony. It is not claimed that they are a specific in every instance of the diseases above enumerated, and it is recommended that the treatment of severe cases should be conducted under the direction of a competent physician. The exhilarating effect of these baths renders their use pleasurable and healthful at all seasons of the year, and for this reason they are largely patronized by the permanent residents of the town. "In chemical ingredients and temperature," says the author above quoted, "these waters are of the nature of the celebrated Carlsbad waters in Bohemia."

They are highly charged with carbonic acid, and many drink the waters with evident relish, though the taste must be acquired rather than natural.

A few hundred feet north of the hot springs is a cold spring, which is similar in its chemical composition to those already described. Owing to litigation, which is pending over the spring, it is in anything but an attractive condition, though this in no wise impairs its therapeutic properties. This water is highly prized as a medicinal beverage, and is kept at the principal hotel, the Beebee, for the use of guests of the house. These springs, both hot and cold, are steadily growing in public favor, and the day is not far distant when Idaho Springs will become one of the most popular watering places on the continent.

SCENIC ATTRACTIONS.

The natural scenery in the immediate vicinity of Idaho Springs is of that delightful variety which pleases rather than astonishes, and, consequently, the visitor never wearies of its contemplation. During the summer months the valley of Chicago Creek is tenanted by numbers of families who pitch their tents and for weeks together retire from the dusty highways of life. A pure mountain stream ripples merrily by; an unlimited supply of dry pine wood for camp-fires is scattered round on every hand, and an emerald carpet of nature's own weaving, enlivened with flowers of rich and exquisite design, is spread at their feet. They are from one to three miles from Idaho, so that they can enjoy the comforts of civilization without suffering its annoyances. Umbrageous pines dot the valley and offer an inviting shelter from the noonday sun. The nights are cool and pleasant, assuring sound, refreshing sleep, and after a few weeks or months spent thus in peaceful quietude, untrammelled by the shackles of society, they return to their homes re-vitalized in being and prepared again to grapple the stern, bread-and-butter realities of life.

Chicago Lakes and Old Chief Mountain are easily accessible from Idaho, and are much visited during the summer season by both residents and tourists. The summit of the latter is about seven miles distant. The trip to this point is very conveniently made in one day, allowing ample time for viewing the magnificent spectacle which is there presented. It is 11,833 feet above sea level, but the ascent is so gradual that it can be accomplished on horseback with little or no fatigue. Chicago Lakes are located at the head of the creek of the same name, fourteen miles from Idaho Springs. It was on the banks of one of these that Bierstadt betrayed the force of his genius in the production of that famous picture, "A Storm in the Rocky Mountains." These lakes are contiguous sheets of water about 11,500 feet above sea level. The area of the lowest is estimated at fifty and the next at twenty acres. They are both well stocked with mountain trout and form the headwaters of Chicago Creek. The third and largest has a surface of about one hundred acres in extent, and is the source of Bear Creek. Saddle horses are required for the trip, the last few miles being traversed by a trail cut through heavy pine timber. Fishing parties usually stay several days, as there is excellent pasturage for saddle and pack animals. Last summer some extraordinary catches were made, as many as thirty trout being caught with hook and line by one person in a single hour. It is but fair to remark, however, that the spotted denizens of these beautiful sheets of water have a scriptural regard for times and seasons.

Sometimes they are peculiarly cautious, the most elaborate flies of natural or artificial workmanship being treated with the utmost contempt. Within from three to five miles of Chicago Lakes is Mount Evans, 14,330 feet high, one of the highest mountains in the State. The ascent of this mountain is not a suitable undertaking for a Sunday School picnic party, but the intrepid mountain-climber who scales its summit is rewarded by a spectacle that is awful in its silent sublimity and overwhelming in its magnificence.

To the mineralogist and the botanist this district offers a rare field for study and research. Fine collections of beautiful and valuable minerals can be made in a short time, or can be purchased at comparatively little cost. During the months of July and August, every hillside is a glowing parterre of uncultivated loveliness, and on the mountain slopes, far up above timber line, thousands of rare Alpine flowers of multifarious hues and unpronounceable names, shed their sweetness on the crisp mountain air. Even to those who snap their fingers at science, and of whom it may be said :

"A primrose on the river's brim—
A yellow primrose was to them,
And nothing more,"

there is an irresistible charm in the feeling of unrestricted freedom, that must be shared by all who have "climbed the trackless mountain all unseen," and lingered in the giant solitude of some far-stretching pine forest, such as here abound. At every point there is something new. Some curious crag; some romantic dell with its ever constant brooklet; some perpendicular rock covered with brilliant and many hued lichens; some foaming, rushing rivulet; some grassy glade basking in the mellow sunlight, or some pleasing combination of the whole that attracts the attention, and indelibly impresses itself upon the memory.

Distances from Idaho Springs, and Altitudes.

	MILES.	FEET.
Argentine Pass.....	24	13,001
Bald Mountain (about).....	11	11,000
Bellevue Mountain (summit).....	3½	9,060
Berthoud Pass.....	25	11,349
Black Hawk.....	7	7,543
Breckenridge.....	54	9,674
Brookvale (Sisty's).....	10	7,500
Central.....	6	8,300
Chicago Lakes.....	14	11,500
Chihuahua (via Argentine Pass).....	29	10,900
Denver.....	35	5,197
Dumont.....	5½	7,930
Empire.....	11	8,583
Fall River.....	2½	7,719
Freeland Mine.....	5	9,000
Georgetown.....	14	8,514
Golden.....	24	5,687
Gray's Peak.....	28	14,341
Green Lake.....	16½	10,200
Hot Sulphur Springs (Middle Park).....	56	7,725
Hukill Mine.....	1½	7,653
Idaho Springs.....	—	7,512
James Peak (about).....	13	13,283
Kokomo (via High Line).....	55	10,200
Lawson.....	8	8,120
Leadville (via High Line).....	73	10,025
Loveland Pass (High Line).....	29	11,500
Mount Evans (about).....	17	14,330
Nevadaville.....	5	8,880
Old Chief Mountain.....	8	11,833
Silver Plume.....	16	9,000

MINING FOR THE PRECIOUS METALS.

In this division will be given a sketch of gold and silver mining as it is prosecuted in Colorado at the present day. In order to illustrate this subject fairly, and render it explicit and acceptable to the general reader, a number of the most prominent mines in the district, together with others of less note, have been chosen. Engravings showing several different kinds of properties and several modes of development, form an interesting feature of the work.

For the past two years the gold and silver mines of Colorado have attracted unusual attention from all quarters of the globe, and for extent, permanency and value, the mineral belt in which Idaho Springs is situated is second to none in the State. The veins are all of the true fissure class, traversing a granitic formation, and carrying gold, silver, copper and lead ores. Several of the properties hereafter described have yielded enormously, while the development of others is yet in its infancy. The Freeland, Hukill, and Lone Tree properties are essentially similar, each consisting of one immense lode in which pyrite is the predominant mineral. The manner and extent of their developments, however, vary considerably. The Stephens and Consolidated Seaton Mountain Mining Co.'s properties represent groups of lodes worked separately: the latter by a deep tunnel running at right angles to the veins, which have a general course throughout the district of north-east and south-west. The Stephens group will probably be developed in the same manner. The latter is illustrated by a horizontal plan of the whole group, and the former by a longitudinal vertical section of the Idaho tunnel, and, consequently, a transverse section of every lode that it crosses which is owned by the Company, but the developments shown on the different veins are not necessarily on the line of the tunnel.

THE FREELAND MINE.

As an ore producer the Freeland mine ranks first in the county, as it does in the method and extent of its development. Its discovery dates back to the era of gold mining in this section,



at which time the apex of the vein was worked for the rich auriferous quartz which it bore. In '76 it came into the possession of John M. Dumont, Esq., of Spanish Bar, who commenced its systematic exploration and continued it in a thorough and business-like manner until its purchase by the Freeland Mining company in April, 1879. The following are the officers of the company: President—Hon. R. C. McCormick; Vice-President—Theodore M. Lilienthal; Treas.—Bank of Nevada; Sec'y.—Edward Willet; Sup't.—F. F. Osbiston. Board of Trustees:—Hon. John P. Jones, Hon. R. C. McCormick, Henry Rosener, Stephen V. White, T. M. Lilienthal. Principal Office—Boreel Building, 115 Broadway, N. Y., Rooms 58 and 60. Capital Stock—\$5,000,000. 200,000 shares; par value, \$25 each. Incorporated under the laws of the State of New York.

The system of exploring the vein by means of adits, which was inaugurated by Mr. Dumont, has been faithfully followed by the Freeland Company under the general management of Col. F. F. Osbiston, up to the present date. It is but fair to state that there are few mines in the county located so favorably for this species of exploration. The limit of horizontal development will be reached, however, in about seven months, when the vein will be opened by a deep shaft. In describing the development of the mine, the reader is referred to the accompanying longitudinal section of the lode, taken on its dip of thirty-six degrees from the perpendicular. The greatest care has been taken to insure accuracy in this engraving, which represents the condition of the mine on May 1st of the present year, and its study will preclude the necessity of a copious written explanation.

The course of the lode is S. 45° W., the developments all tending westerly. The Freeland and the Minnie levels are the only ones on which horizontal development is now progressing. These are the main adits of the mine.

The distance between them is 225 feet, measured on the pitch of the vein. The mouth of the Minnie is nearly 450 feet westerly from that of the Freeland, and the distance from the breast of the Freeland to the westerly end of the property is something over 650 feet. The Platt level is 245 feet above the Minnie. Two shafts, near the westerly end of the claim, and the Diamond level, are now of no value except to show the continuity of the deposit. The breast of the Freeland level is now about 925 feet below the surface; when continued to the end of the property it will be nearly 1,100 feet deep. This level is now going ahead at the rate of about 140 feet per month. If this is kept up for the next six months an average of 3,850 fathoms of ground will be opened monthly during that time. The average height of the back-stopes in the Freeland level is 40 feet; 20 in Minnie and 60 feet in the Platt. Some idea may be formed from this of the enormous ore reserves on hand. The chutes

running up into the stopes are 40 feet apart, and for convenience are always kept a number of feet higher than the stopes. They are usually four feet square inside the timbers and are provided with doors at the bottom, so that the ore can be run directly into the car, entirely obviating the use of shovels in loading, except in the breasts of the drifts. These are exactly as represented in the engraving.

The ore vein in the back stopes above the Freeland tunnel averages from fourteen to seventeen inches in width, while the breast of the drift shows fourteen inches of solid ore, besides much scattered mineral. This consists mainly of iron pyrites and copper pyrites. Bunches of galena are found occasionally and carbonate of iron is common. The ore in the Minnie is similar to that found in the Freeland, both in quantity and quality. Indeed the ore vein of the Freeland mine is so regular that a full description of the different levels and stopes would be monotonous to anyone but a stockholder. Suffice it to say that an ore vein varying in width from six inches to three feet now exists in the different stopes. The mine is not now producing sufficient galena to justify its separation from the pyrites. Tennantite, a somewhat rare mineral, consisting of copper, iron, sulphur and arsenic, is a peculiarity of the Freeland.

It is a gratifying feature of this mine that the ore steadily improves with depth. About 20 sacks of picked ore, consisting largely of erubescite, and averaging 60 pounds to the sack, are taken monthly from the Freeland level. This will mill from 700 to 1,500 dollars per ton, and runs all the way from 25 to 35 per cent. in copper. About ten tons of first-class, worth \$80 per ton, are saved daily. The great bulk of the mineral, that adapted to concentration, is worth \$60 per ton when dressed, the proportion of dressed to crude ore being as one to two and three-tenths. One hundred and fifteen tons of this are concentrated daily at the company's works, and 35 tons are sent daily to the old Collom mill, now leased by John Roberts, at Idaho. About two-thirds of the value of the concentrations are gold. The remainder is accounted for by an average of six per cent. of copper and some silver. The first class is sent to the Boston & Colorado works at Argo, and runs 20 per cent. in copper, and one and a half ounces of gold and 36 ounces of silver per ton.

At the present time sixty-five men are employed on the stopes on days' wages. The drifting and raising is all done under contract at an uniform price of \$3.50 per foot, and this is the only work on which double hand drilling is used. In every department the most thorough discipline is observed, and dismissal is the immediate result of inferior workmanship of any description, but nothing tyrannical is seen. Accidents are extremely rare, there having been but one that resulted fatally since the first opening of the mine, and that was the result of

the poor fellow's own carelessness, as is too often the case in mining casualties. The timber work is of the most thorough description, stulls of immense size being used at short intervals. This is another instance in which the owners of the Freeland are naturally fortunate. Within a mile of the mine there exists a practically exhaustless supply of pine timber suitable for mining purposes, and a saw mill owned by the company insures its economic utilization.

The general plan for sinking a deep shaft, commencing on the Freeland level, is definitely arranged. Machinery sufficiently heavy for sinking 2,000 feet will be used. The shaft will be 6 x 16 feet in size, divided into three compartments and solidly cribbed with 12-inch timbers. Levels will be made about 100 feet apart. A giraffe, holding ten tons of mineral, will be used for hoisting, running on railroad iron laid on the incline of the vein. The ore will be run directly into the giraffe without handling. On the Freeland level will be a chute with a capacity of four to five hundred tons of ore. By some automatic device the giraffe will discharge its load into the chute, whence it can be run into the cars and thence transported to the dressing works. The company has not yet decided whether it will be operated by an engine especially for that purpose, or by the mill engine through the medium of an endless wire rope. At the mouth of the Freeland tunnel are the concentrating works, the assay and business offices, blacksmith and carpenter shops, two store houses for supplies, stables, dwelling houses, etc., and at the railroad at the foot of Trail Run is an ore house holding 150 tons of dressed ore.

John N. Palmer, Esq., one of the most practical men in the State, is superintendent of the property. Mr. A. P. Webster, late assayer at the Consolidated Virginia, now fills that office for both the Freeland and Hukill mines, and Mr. Wm. Osbiston is accountant for the Freeland company. James Trevillion, the foreman of the mine, will very probably be found in some of the back stopes. Blunt, unwavering, experienced in mining, and as near ubiquitous as any mortal can be, with a kind word for the men whenever it seems to be needed, "Jim" snugly fills the bill of an "honest miner" and a trusty foreman.

The enormous ore reserves of the Freeland will be seen by a single glance at the plan of the mine. The value of that part of the vein lying below the Freeland tunnel far exceeds that of the developed portion, however. The best criterion of the value of the mine is the simple fact that a dividend of \$50,000 was paid May 20th, and a like amount will be paid every three months from that date.

THE FREELAND DRESSING WORKS.

The Freeland dressing works, which are generally acknowl-

edged to be the best in the State, are of sufficient extent to claim a separate chapter.

This mill has been in operation about eight months, and is eminently successful, the only draw-back being a lack of sufficient capacity to treat more than one-third of the ore which could be taken from the mine. The capacity is 115 tons per day. The dimensions of the building are as follows: jig room, 75x62 feet; ore floor, 48x35; engine and boiler floor, 35x43. The dumping floor is 85 feet from the mouth of the Freeland tunnel, which is the avenue for every pound of ore taken from the mine. The crushing machinery consists of two Blake crushers, 7x10 inches in size, and three pairs of Cornish rolls, each 14-inch face and 22 inches in diameter. The sizing appliances are eight revolving screens, in pairs, the first two sizing the mineral in a dry state, the last six being supplied with water and another ingenious device for sizing the finer mineral. The separation of the ore from the worthless rock, or concentration, of the coarser mineral is effected by twelve Hartz jigs, and the finest material, the slime, is divided into pure ore, seconds and tailings, by a rotary circular buddle. From the dry screens the coarser particles are returned to the central pair of rolls to be re-crushed, and the finer material is passed down to the wet screens, where it is sized for the jigs. The jigs, like the screens, consist of two sets, counterparts of each other. Each set turns out four sizes of dressed ore, and each jig four grades, the whole forming, when placed in phials and labelled, an interesting representation of the efficiency of the Hartz jig. This is a highly scientific process, and its success depends in a great degree on the amount of "bed" carried in each jig compartment and the quantity of water used.

The refuse, denominated "tailings," is usually considered worthless. In the case of the Freeland, however, where everything is worked on a large and economical scale, it is proposed to work the tailings over again and save as much of the \$3.17 per ton that they contain as human ingenuity can do. For this purpose the company has recently purchased a piece of property at the foot of Trail run, where a 15-stamp mill will be erected and the tailings subjected to that mode of treatment. Four circular buddles and six jigs will also be used at that point. This is about two and one-half miles from the mine, and the crushed ore, tailings and slimes will be run down a flume to the point mentioned, where there is an abundance of water.

The cost of concentrating the Freeland ore is 70 cents per ton, the mineral being reduced sixty per cent during the process. The cost of hauling to the railroad is one dollar per ton. Nine men on each shift are all that are required to run the mill. Four cords of wood, at an expense of two and a half dollars per cord, are consumed daily. This supplies steam for the motive power

and for drying the concentrations. The engine is 100-horse power and the boilers have double that capacity. The boilers are fed by a No. 3 Knowles pump, and a No. 5 pump of the same kind is used for returning the water from the settlers to the concentrators. Once in twenty-four hours all the machinery of the dressing works is carefully inspected, and a full supply of water and hose and a Cameron pump are kept in readiness in case of fire. The mill is under the foremanship of the Carkeek brothers, John and Richard, who have had a long experience in the business. The cheap concentration of our ores is a matter of vital interest to this district, and at no other place is the business conducted so extensively, thoroughly and cheaply as at the Freeland.

THE HUKILL.

This great vein crosses Clear Creek about one and a half miles above Idaho Springs. The Whale and the Hukill are connected claims on one lode, and as they have a common ownership they will be described collectively.

The total length of the two claims is 3,188 feet, and the horizontal and vertical developments aggregate about 5,000 lineal feet. The Hukill was first worked for surface gold, and in 1871 it was purchased by Jno. M. Dumont, who prosecuted its development for a number of years at a satisfactory profit. Later it became the property of the Hukill Gold & Silver Mining Co., which still retains its possession. The developments thus far were mainly confined to the north side of the creek, where one of the finest veins of ore in the county was exploited to that level.

In '78 a vertical shaft was started a short distance south of the creek. In '79 a party of Californians purchased a controlling interest and lent a decided stimulus to the development of the mine. The following accurate description of the present working of the property is taken from a late number of *The Colorado Miner*:

"The Delano shaft is perpendicular and is 235 feet deep. The shaft was started nearly on the crevice, but as this pitches to the west at an angle of about 14 degrees, the shaft and vein are gradually diverging as depth is gained. The first level was run at a depth of 77 feet from the surface, and here the shaft and lode are together. At the second level, 65 feet lower down, they are 22 feet apart, and at the third and lowest level, an additional depth of 86 feet, the intervening distance is 52 feet. The first, second and third levels are open respectively 79, 127 and 60 feet north of the shaft, and 80, 95 and 80 feet south.

"The south drift on the first level carries several feet of ore of a good quality. In the north drift the mineral is more scat-

tered. The second level shows an excellent vein of ore at every point, ranging in width from two to four feet. The stopes above this level have attained a height of fifteen feet at one point, showing a vein of ore from four to seven feet in width. This consists of iron pyrites and copper pyrites, carrying streaks and bunches of fine-grained erubescite, which constitutes the first-class ore and runs high in both gold and silver. The lower level carries from two to four feet of an ore vein throughout its length, and but little stoping has been done there. The developments on this level are highly satisfactory, as the ore is found to be improving with depth.

"The last four car loads of ore shipped from this mine ran over \$150 per ton in gold, silver and copper. Concentrating ore is now sent to the Stephens mill, at Lawson, at the rate of twenty tons per day. There is now nearly fifteen hundred tons of ore at the surface awaiting shipment. About two tons of first-class are taken from the mine daily.

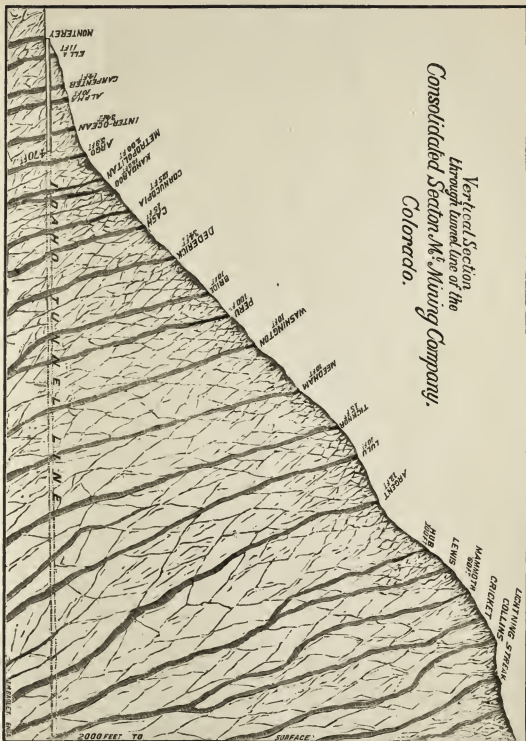
"About thirty-five men are now employed on the mine, several of this number being steadily engaged in the sorting house. The surface improvements consist of an engine-house 83x28 and an ore-house 18x40, with blacksmith shop, on the dump. The assay, business and other offices are located in the old Whale mill. The engine is 35 horse-power, and the hoisting apparatus the neatest and most perfect of any in the county. This consists of a cage on which the cars are run, these holding a ton each. Everything around the mine bears evidence of careful supervision, Col. F. F. Osbiston having the management."

Due allowance should here be made for recent drifting. The changes in the ore since the above was written, denote an improvement in quality, and confirm statements as to its general high grade. The Hukill ore is peculiarly rich compared with other mines in this district in which the mineral is mainly pyritic. The first-class sometimes carries copper to the value of \$40 per ton, but from three to ten per cent. is probably about an average range. Something over \$600,000 have been taken from the Hukill claim alone since 1871. The Hukill is, without doubt, one of the most profitable and reliable mines in the great mineral belt that traverses Clear Creek and Gilpin counties, and under its present management, the public may rest assured that its development will be prosecuted with the vigor that its importance demands.

Mr. John Prout, one of the most practical and experienced miners of the West, has full foremanship of the mine, and possesses the well-merited confidence of Col. Osbiston, under whom he has served in his present capacity for many years at the celebrated Nevada mines.

Following is the organization of the company: Principal Office—No. 115 Broadway, N. Y., Boreel Building, Rooms 58

*Vertical Section
through boreal line of the
Consolidated Sector M^o Mining Company.
Colorado.*





and 60. Capital—\$1,000,000. 200,000 shares, par value \$5. Superintendent at mine—F. F. Osbiston; President—J. L. Brownell; Treasurer—S. V. White; Secretary—E. W. Willet. Board of Trustees—Nath'l A. Boynton, George H. Seeley, Benjamin F. Blair, J. L. Brownell, S. V. White.

THE GREAT CONSOLIDATION.—THE CONSOLIDATED SEATON MOUNTAIN MINING COMPANY.—CAPITAL \$5,000,000—500,000 SHARES OF \$10 EACH.

This Company has purchased and owns two tunnels, called the "Colorado" and the "Idaho," and most of the mines cut by them on the southern slope of Seaton mountain. Many of these mines, some patented and all to be patented, have been sufficiently developed to prove that they will be remunerative, such for instance, as the Hub, Inter-Ocean, Kangaroo, Argo, Dragon, Cornucopia, France and France Extension, whilst the rest, numbering over twenty-five (besides blind lodes which the tunnels will intersect) give indications of decided promise. The few mines not belonging to this Company but in the same belt on the southern slope of the mountain, such as the Seaton, Victor, Gem, Metropolitan and Tropic, have been, and, when worked, continue to be, highly productive.

Seaton mountain is situated about one mile north of Idaho Springs. It is celebrated as a vast deposit of mineral wealth, not by mere conjecture, but by actual proof in yield of paying ore. This great enterprise, projected and prosecuted thus far successfully, has been closely investigated by not only the ablest and most experienced mining experts employed by the corporators prior to the purchase of the property, but also by scores of the oldest and most successful practical miners, and the judgment has been unanimous that the driving of these tunnels into the heart of that rich mountain, cannot fail to yield an enormous return to the Company, as most of the lodes will be cut at great depth; and the opinion is generally held by competent judges that many of these lodes with which the mountain is seamed, sometimes in parallel lines and sometimes crossing each other at various angles, will be found to unite as depth is attained, and that where they unite large bodies of ore will be found.

The object of the consolidation was to cover by purchase as much of the southern slope of the mountain as possible, and to develop the numerous lodes thus bought, and such as may be secured by tunnel right by the Idaho and Colorado tunnels, which are driven in different directions and will cut most of the lodes at such a depth as will insure profitable working. The Idaho tunnel, the first undertaken, which is conceded to be a model, has been driven some 500 feet, and has cut through the

first valuable lode, the Inter-Ocean, upon which drifting has commenced with gratifying results. The great belt of promising mines is yet ahead of both tunnels, the Colorado having been driven only to bed-rock. The average grade of ore from the mines is from \$100 to \$200 to the ton in gold and silver, and in some cases more than \$400 to the ton. This is not an estimate of mere assays, as these run up to thousands of dollars to the ton.

One important feature of this vast property is the ease with which it can be reached, there being excellent wagon roads with easy grades to the mouths of the tunnels, never interfered with by snow, so that this facility of access insures working all the year, and ready supervision of the work at all seasons, not only by the Superintendent but by all interested and desiring to watch the progress of the enterprise. The immediate proximity of the railroad, which leads to numerous competing reduction works, adds also greatly to the value of the property. The proprietors of valuable mines intersected by tunnels will gladly pay a royalty for their use. It has been demonstrated beyond a possibility of doubt that in furnishing a certain channel for the drainage of mines, and for taking out of the ore on a level and in cars, instead of the laborious and expensive hoisting of both water and ore, tunneling is the most expeditious and economical method of mining, especially where, as in the case of Seaton mountain, the declivity is such as to justify it.

The articles of incorporation of the new Company show the Directors for the first year to be Thomas B. Bryan, Harvey M. Thompson, John McEwen, E. E. Mack, Samuel D. Ward, and Jesse Gillmore. Hon. Thomas B. Bryan has been chosen President, Harvey M. Thompson, Vice-President, and Samuel D. Ward, Treasurer. It has been well said that "Considering the large number of mines embraced in the consolidation, the well known richness of the mountain, the admirable location of the tunnels, the ample dumping ground and other facilities for working, and the ease of access at all seasons, this enterprise is as promising as it is colossal."

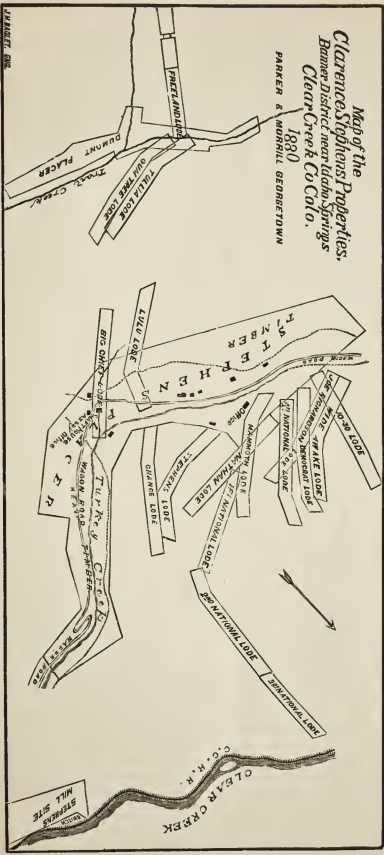
THE STEPHENS PROPERTY

is located in Banner district, three miles above Idaho. It consists of sixteen lode claims, a placer claim of one hundred acres and a mill site of five acres, all within a short distance of the Freeland, as will be seen by the accompanying plat.

This collective property is the result of individual enterprise solely. During the summer of '78, Mr. Clarence Stephens, the sole owner, first commenced operations in this district, the inducement being the discovery of rich auriferous surface quartz. From that time to the present day he has been diligently making discoveries and perfecting titles, and is rewarded in the pos-

Map of the Clarence Stephens Properties. Banner District near Idaho Springs Clear Creek Co Colo.

1880
 PARKER & MORRILL GEORGETOWN





session of one of the most valuable mining properties in the county.

The Big Chief shows a greater amount of development than any other lode in the group. It is opened by an adit 235 feet long and a shaft 210 feet deep, these avenues intersecting each other at a depth of 35 feet and a length of 60 feet. The second level is opened 60 feet westerly from the shaft and is 103 feet below the main adit. The third level, on which drifting is but just started, is 60 feet lower down. Each of these levels is supplied with twelve-pound iron T-rails. The lode, as far as explored, carries a solid ore vein of an average width of fifteen inches, in addition to which there is usually a fair amount of scattered ore suitable for concentration. The ore is similar to that of the Freeland in every respect, and there is no question in the mind of the writer as to the identity of these lodes. They both carry unusual quantities of carbonate of iron (siderite), their pitch is the same—from 36 to 40 degrees from the perpendicular, and they have a uniform strike, surface irregularities changing the course of their apexes to some extent. Fair samples of the ore range from \$40 to \$167 per ton in gold, silver and copper, the latter metal running from ten to fourteen per cent. There are 400 tons of this class of ore on the dump. It consists of iron pyrites (pyrite), copper pyrites (chalcopyrite), gray copper (tetrahedrite), and black oxide of copper (tenorite). The hoisting is done by a California whim with a horse at each end—a new idea. The improvements at the surface consist of a whim and ore house, assay office and blacksmith shop. Every feature of this lode shows it to be one of great strength and value, the ore gradually improving with depth.

The Lulu and the Chance are different claims on the same vein, the former being opened by a 69-foot shaft and the latter by two shafts of 40 feet each, and a 70-foot adit. The quality of the ore in the two claims is identical, carrying from ten to twelve ounces of gold per cord. Both are patented and show undoubted characteristics of a true fissure vein.

The Stephens is another patented lode, the cellular quartz, in which gold can frequently be seen, carrying from ten to twelve ounces of gold per ton. It is opened by a 55-foot shaft and level, and a 100-foot adit, there being at these points, an estimated amount of 230 tons of surface ore. At the time of its purchase by Mr. Stephens, it was worked by a trio of men who made good wages by simply crushing the quartz in a mortar and panning out the gold.

The Mammoth is all that its name implies, being 16 feet in width. It is opened by a shaft 100 feet deep, carrying a solid two-inch vein of chalcopyrite, galena and zinc blende (sphalerite). This assays \$67 in gold and silver. For six feet in width the lode carries scattered mineral.

The Nathan is a remarkably strong auriferous vein, possessing more lineal development than any other in the group. The first-class ore assays $9\frac{1}{2}$ ounces of gold per ton and the second-class about that much per cord, a cord of this ore being about seven tons. It is opened by four shafts, 65, 40, 38 and 35 feet deep, together with an adit of 235 feet in length. There is an enormous amount of milling quartz already taken out of this vein.

The First National has a shaft 80 feet deep, and about 250 tons of average grade ore on the dump. There is a drift west from the bottom of the shaft a distance of 163 feet. This is at a depth of 65 feet, and shows a strong quartz vein from one to four and a half feet thick. The bottom of the shaft carries from four to eight inches of copper and iron pyrites in a white quartz gouge.

The Second National and Third National are undeveloped locations on the same vein, which is 55 feet wide at the apex, the last named running down to the Colorado Central railroad, and presenting an excellent opportunity for tunneling.

The Fourth National, Wide-Awake, Joe Richardson, Democrat and Ten-Thirty lodes are but little developed. They are opened by numerous shafts and trenches aggregating 130 feet in depth. This proves that they are all strong, three to four-foot crevices, the surface quartz assaying from one to two and a half ounces, gold, and from ten to eighteen ounces, silver, per ton, and from two to four per cent. in copper.

The Oregon and Black Prince are not given in the plat. The former is opened by four shafts aggregating 90 feet in depth. It shows a fourteen-inch vein of ore, principally galena, that assays in silver eighteen ounces per ton, in gold two or three ounces per ton and 40 per cent. in lead. The latter has had but little work done upon it.

We have thus given a brief description of the separate properties. It is its collective merits, however, that renders this mining property of such great importance, although the Big Chief is in itself, as shown by the developments, a most valuable property. As a scale is not given on the plat, it should be remembered that the claims are each 1,500 feet in length, which will serve as a basis of measurement. The elevation of the railroad at the foot of Turkey creek is 8,100 feet. The altitude of Mr. Stephens' office, which is about the mean elevation of the mines, is 9,225 feet, so that a tunnel run in on the Third National would, after making sufficient allowance for dumpage, cut the bulk of the lodes at a depth of 1,000 feet.

The principal advantages offered by this group of mines are, compactness, an abundance of timber, a clear title—eight of the lodes now being patented—great accessibility when the wagon road now in progress is completed, excellent railroad

facilities and an unlimited supply of water in Clear creek. The side track and wagon road will be completed within a month. Plans for the full development of the property have not yet been perfected. This is a matter requiring the most careful consideration. Whatever may be done, however, concentrating works for the solid mineral and a stamp mill for the auriferous quartz, both built on Clear creek, will be a matter of necessity, and will doubtless be erected at the earliest convenience of the owner.

Mr. Stephens has superintended all the operations since the commencement, and in the development of the different lodes he has been ably seconded by his experienced foreman, John M. Patterson. Every lode is covered by its survey. Nothing has been slighted. Mr. S. does the assaying himself, and as a test of the delicacy of his scales, the writer, upon a recent visit, furnished him a fragment of human hair less than one-eighth of an inch in weight, which was accurately weighed.

Work is steadily progressing on the Big Chief lode and the improvements just mentioned. If this is not one of the most valuable mining properties in the whole district, experience and close observation avail nothing, and quantity and quality of ore, with great natural advantages, are no criterion of merit.

THE LONE TREE.

This mine, which is located on Trail Creek, about one thousand feet westerly from the famous Freeland mine, is one of the most strongly defined mineral veins in the county. It is owned by John M. Dumont, Esq., of Spanish Bar, who is now commencing to open it up in a manner commensurate to its importance.

The property consists of two patented claims having a course of N. 27° E. The Lone Tree is the northerly claim and is 1,300 feet in length. At its southern extremity the Lone Tree Extension continues in that direction a distance of 1,500 feet. A placer claim that takes in Trail Creek for a distance of nearly half a mile, and two mill sites, each of four acres in extent, are owned in connection with the property. These will be invaluable for sites for the erection of concentrating or other works to be hereafter used for the treatment of the mineral.

In point of location, the Lone Tree and its extension are peculiarly favored. The ground marked by the apex of the lode is entirely free from the abruptness so common in this county, and the property may be easily developed at any point on the linear distance of 2,800 feet, and 150 feet in width, that define its boundaries. The mountain at this point is thoroughly covered with slide, rendering the construction of wagon roads a matter of comparatively little expense. More or less pine timber suitable for mining purposes is scattered over the whole

length of the property, and at the southerly end an extensive pine forest awaits only the ax of the woodchopper to convert it into stulls and lagging. If required, half a dozen shafts could be sunk on the property simultaneously.

The development of the property is entirely in its infancy, but enough has been done to prove the remarkable strength and regularity of the lode and the profitable character of the mineral. For a distance of 1,800 feet a number of surface shafts, varying in depth from 25 to 75 feet, were sunk for the decomposed, auriferous quartz which was treated at the stamp mills, and often run as high as \$250, in gold, to the cord. This, however, was mere surface work and no attempt was made to develop the lode systematically. True, the discovery shaft of the extension was sunk to a depth of 150 feet, and a large strong crevice carrying from two to five feet of auriferous quartz and oxidized minerals, gradually running into fine-grained iron pyrites, was disclosed all the way down; but it is a question whether this is the best point for the economic development of the property. A contract has been let for sinking a shaft 200 feet northerly from the last named. This will be $10 \times 4\frac{1}{2}$ feet in size, and will be continued down to the line of an adit which is being run southerly on the lode, commencing at a point about 300 feet from the northerly end of the claim. This is now 550 feet in length and abundantly proves the strong mineral character of the lode. It will be necessary to drift 250 feet further to intersect the line of the shaft on which sinking is now progressing. The tunnel at that point will be 180 feet below the surface. This will probably be continued and connected with several other shafts lying further south. These developments may be considered as preliminary, however, the entire plans for the general development of the property not having been completed.

The character of the ore is that peculiar to the mines of this district—auriferous pyrites carrying a profitable percentage of copper with more or less silver. A large number of assays taken from different points on the lode show that the ore ranges in value from \$40 to \$200 per ton. Past experience in this district proves that this variety of mineral invariably improves in quality as depth is gained. The crevice is from five to eight feet in width and is usually mineralized throughout the whole width. The lode pitches at an angle of about ten degrees from the perpendicular, and preserves remarkable uniformity in course, width, pitch and general characteristics as far as explored.

This is undoubtedly one of the strongest fissure veins in the county, and its further development will prove it to be one of the most productive. A deep shaft will probably be sunk somewhere near the junction of the two claims. Whatever method may be adopted and wherever the development may

commence, the public may rest assured that under its present management the working of the mine will be vigorously and wisely conducted.

This will be prosecuted under the general management of Mr. Dumont, assisted by Mr. Geo. G. Vivian, who resides on the premises and gives the mine his daily supervision. Mr. Vivian's long experience in the mines of this district and his skill as a metallurgist render him well qualified to fill this position.

THE TROPIC MINE.

This property is situated on Seaton hill, two miles from Idaho Springs, and is owned by Messrs. J. I. Gilbert and Joseph Reynolds. It has been steadily developed by these gentlemen the past two years, and this has proven it to be one of the most valuable mines of this county.

The main shaft of the mine is 180 feet deep. The first level is reached at a depth of 32 feet and has been opened a distance of 570 feet easterly. Fifty feet lower is the second level, which is opened 210 feet westerly and 390 feet easterly. The next and lowest level is 80 feet below the second and is drifted 60 feet west of the shaft. On this level no stoping has been done. The average height of the stopes in the second level is fifteen feet, and for 300 feet in the first level the stopes are raised to an average height of ten feet.

The ore vein, taken throughout the mine, will average from a foot to a foot and a half in width, the bottom of the shaft carrying eighteen inches of nearly solid ore. The ore consists of galena, gray copper, yellow copper and iron pyrites. The first-class is worth from \$110 to \$180 per ton. The second-class mills from \$30 to \$110, and the concentrating ore from \$40 to \$50 per ton. The first-class ore carries $\frac{3}{4}$ of an ounce of gold and 170 ounces of silver per ton, and contains from four to six per cent. of copper.

Drifting is progressing on the third level both east and west, and on the second level east of the shaft. Sinking the shaft is suspended until the arrival of a 50-horse power hoisting engine, which is now on the way to the mine. Twenty men are employed, but four of these being in the stopes. The monthly output is about 50 tons of ore of all classes.

The scarcity of water in this mine is a singular but satisfactory feature, no barriers being offered to development from this source. The great uniformity of the quality of the ore is something remarkable. Subsequent developments will confirm our conviction of the high value of the Tropic lode.

FAIRMOUNT-SCHAFFTER.

This consolidated property is located in Hukill Gulch, one and a half miles from Idaho Springs. It is owned by Eastern

parties and superintended by W. T. Glaser, Esq., who is prosecuting its development vigorously and systematically.

The total length of the two claims is 2,160 feet. A number of shafts have been sunk on the vein, but the principal points of development are the Fairmount shaft and the Philadelphia tunnel. The shaft is 170 feet deep and the tunnel is 160 feet long. It is expected that the latter will intersect the lode within a further distance of 220 feet, and from that point a drift will be run on the lode, a distance of about 275 feet, to connect with the shaft, which is being sunk to this level. This connection will answer the double purpose of drainage and ventilation, besides affording extra facilities for the exploitation of the mineral.

At a depth of 100 feet in the shaft a drift has been run 110 feet easterly and 60 feet westerly. Other minor developments have been made, all showing the continuity of the ore deposit. The ore vein ranges in width from several inches to three feet, and consists of iron pyrites, copper pyrites and black oxide of copper. Fourteen lots of ore sold averaged \$200 per ton in gold, silver and copper. A shaft 100 feet deep more than paid all expenses of sinking, by simply panning out the free gold.

This property has an excellent reputation among the mines of this district, and under its present management will rank well as an ore producer. Ingersoll drills and air compressors will shortly be used in tunneling, and as soon as necessary a hoisting engine will be put up at the shaft, which is now operated by a whim. About twenty-five men are now employed on the premises, and the developments are daily adding to the value of the property.

THE KANSAS CITY TUNNEL PROPERTIES.

This is a tunnel site and a group of lodes owned by Dr. A. M. Noxon, of Idaho. The associated properties are located on the east side of Virginia canon and north of Robinson gulch, about one and a half miles from Idaho. Within the first 600 feet the tunnel will cut twelve lodes, all owned by Dr. Noxon. The first of the lodes is the Hudson, which will be intersected at forty feet. Ore is disseminated through six feet of the vein matter, two feet of which is pretty solid ore, milling \$200 per ton in gold and silver, the remainder being good concentrating ore. The vein has been explored by a shaft 26 feet deep. The Highlander is located 85 feet farther in the mountain. This lode has been opened by a shaft 25 feet deep. The walls are five feet apart, inclosing a sixteen-inch vein of iron pyrites, copper pyrites, black oxide of copper and galena that mills \$114 per ton in gold and silver.

The remainder of the lodes comprised in this tunnel property are practically undeveloped. Sufficient work has been

done to prove them to be valuable prospects, however, and but little more is necessary until they are intersected by the tunnel. The tunnel claim is 3,000 feet in length, and 1,500 feet in width, the central line crossing the courses of the Specie Payment, Trio and many others of the profitable veins which cross Virginia canon near its head. The continuance of the tunnel to the northerly end of the ground will render it the main artery of the mountain which it penetrates. The mouth of the tunnel is but about 60 feet from the Virginia canon wagon road and the facilities for dumpage are unequaled.

For the amount of work done on them, the Hudson and the Highlander are two of the most promising and valuable lodes in the district. Mineral from the former assays as high as \$1,600 per ton. The writer makes particular mention of the latter lode, as he has had the ore tested and is fully aware of its excellent quality. The figures given above are sufficient proof of the value of these lodes, and of the importance of the tunnel enterprise. Its completion would develop a belt unsurpassed in this county for value and permanency.

THE HIGH GRADE MINE.

This is a full mining claim lying in Virginia canon, one and a half miles from Idaho Springs. It is developed by an adit 350 feet in length, a shaft sunk near the breast of the same 40 feet deep and a level therein 25 feet long. Judge Geo. L. Cannon is the owner of the property. The pay vein is from sixteen to eighteen inches in width, and the owner informs us that this will average \$100 per ton. The ore is pyritic, carrying both gold and silver. Three cross veins, which show remarkably well, have been intersected by the adit. The property is very favorably located for economic development, the adit in question opening right on to the wagon road. The adit is provided with a substantial track, planked its entire distance, and the ventilation and drainage are perfect.

NIAGARA TUNNEL PROPERTY.

This property consists of twelve lode claims lying in Spring gulch, about two and a half miles from Idaho Springs. They are owned by Dr. J. S. Mead and Calvin Camp, and are named the Wake-up-Jack, Niagara, Byron, Bullginc, Mead, Camp, Lalla Rookh, Polar Star, O'Hara, Manganese, Comstock and Donaldson.

The principal developments are on the Niagara and Byron lodes, which have been intersected by the Niagara tunnel, and explored by drifts fifty to sixty feet in length. About 200 tons of ore, ranging in value from \$30 to \$90 per ton, net, have been taken from the lodes during the process of development.

The Donaldson possesses the largest share of developments.

It has been opened by several shafts, which show from twelve to twenty-six inches of auriferous quartz, worth from \$71 to \$481 per ton. Developments are progressing on this lode.

But little exploration has been done on the other claims. The Niagara, Golden Link and Stanley claims have been traced on the surface to their connection with the Whale lode, and there is a strong probability that they are on the same great vein as the Whale and Hukill. The Niagara tunnel is 200 feet long, and was run to develop the lodes just mentioned.

THE LITTLE ETTA TUNNEL PROPERTY,

comprising fourteen different lode claims, lies directly west of the Niagara tunnel property, many of the claims being on the same veins.

The claims are owned by the Idaho Springs Gold and Silver Mining Company, J. B. Beauzy, Pres., L. A. Gilbert, Vice-Pres., Jesse Gillmore, Sec. and Treas. and John S. Mead, Supt. The principal ones are the Althea, Lillie, Etta and Cleopatra. The mill runs from a ten-inch pay streak carried by the Little Etta lode yielded from \$59 to \$270 per ton.

East of this property are the Fraction and Kitty Clyde lodes, owned by Dr. John S. Mead. The latter has been stripped for several hundred feet on the surface, yielding large quantities of auriferous quartz. Work is progressing on a shaft which is now fifty feet deep. This carries a profitable vein of ore, which is gradually improving as depth is gained. The development of the property will be actively prosecuted during the present summer.

DOMINION MINING AND SMELTING COMPANY.

This is a comparatively new Company and is operating in Hukill gulch. The Dominion lode is opened by four shafts, aggregating 165 feet in depth. These developments show this to be an excellent property, carrying a pay vein eighteen inches in width, consisting of iron pyrites, copper pyrites and galena, the galena predominating. A late run of seventy-five sacks milled \$387 per ton in gold, silver and lead, the latter running 35 per cent. Specimen assays have run as high as \$600, but the best criterion of the value of the property consists in the fact that it paid for development, and also that a small run is taken out nearly every week. The development of the property is steadily progressing under the superintendency of Mr. L. A. Gilbert, of Idaho Springs. The officers of the Company are Sylvester D. Foss, President, L. A. Gilbert, Vice-President, Alex. H. Gunn, Secretary and Treasurer. Capital stock \$1,000,000—100,000 shares at \$10 each.

GREAT REPUBLICAN.

This lode is located on Chicago Creek, two miles from

Idaho Springs, and is owned by P. R. Stanhope, James L. Morris and Joseph Wagner. It is opened by a 40-inch adit from the breast of which a shaft is being sunk. The crevice is from ten to twelve feet wide. It carries scattered mineral on each wall, both veins aggregating about thirty inches. The principal bulk of the ore is galena, carrying gray copper and native silver. A vein of ore on the foot wall will average from four to twelve inches in width. This runs 112 ounces of silver per ton for first-class ore and 61 ounces for second-class.

THE LITTLE METTA

is the eastern extension of the Great Republican, and is owned by Robert Parker. The developments consist of a fifty-foot adit which shows from two to six inches of solid galena, that mills 125 ounces of silver per ton. Both these lodes are discoveries of the present season and for the amount of development done on them are highly promising properties.

THE PATTEN MINE.

This property is located in Virginia canon, and all the developments made on it show it to be a remarkably strong and uniform mineral deposit. It is opened on the surface by a number of shafts, all carrying a decided vein of iron pyrites and copper pyrites, with occasional bunches of galena. The lode is further developed by an adit about 220 feet in length. This shows a continuous vein of auriferous pyrite that runs from one to five ounces of gold and from ten to twenty-five ounces of silver per ton, and from two to ten per cent copper. The breasts of the drifts show nearly two feet of this grade of ore. The excellent facilities for the development of the property adds immensely to its value. Taken altogether this is one of the most promising mines in the district. It is owned by the Patten brothers, of Idaho Springs.

THE RUBICON

is situated in Dry gulch, about a mile from Idaho, and is developed by a shaft 30 feet deep, showing eighteen to twenty inches of quartz that averages forty dollars per ton. It is owned by Geo. L. Cannon, of Idaho Springs.

THE GREAT MOGUL

is a full claim, 1,500x500 feet. It is owned by Judge Geo. L. Cannon, and is located on the westerly slope of Bellvue mountain, which is about four miles from Idaho, and carries a number of well known gold lodes. A shaft 130 feet deep and a connected level 90 feet long show this to be a strong fissure vein carrying a pay streak from two to three feet in width that averages \$60 per ton.

THE ADRIE CONS. GOLD AND SILVER MINING COMPANY

has recently purchased the Adrie, Tremont and Amelia lodes, which are located near the High Grade mine, in Virginia canon. The veins are developed by shafts from 20 to 40 feet deep, the quarts assaying unusually well. The Company has ample capital, and will soon commence the development of the properties on an extensive scale. Judge Cannon is the Superintendent.

THE SEVEN-TWENTY

lode is located in Buttermilk gulch, about two miles from Idaho Springs. It is opened by a shaft 240 feet deep, from which several levels have been run. The ore vein averages from four to ten inches in width, and the ore yields from 50 to 450 ounces of silver per ton. The property is owned by B. T. Wells and R. H. Gibson. There is a tunnel site in connection with this property. A tunnel has already been started, and this will cut the lode at a depth of 400 feet.

This tunnel also cuts a number of well known lodes, among which are the Tropic, Gem, Pine Shade and Veto. The last named is owned by R. H. Gibson, and will be cut by the tunnel at 800 feet from its mouth. There is a shaft on the vein 40 feet deep, carrying ore that assays from 40 to 245 ounces in silver.

The Gem is a valuable lode, carrying eighteen inches in galena, copper pyrites and iron pyrites that average from \$50 to \$60 per ton in gold and silver.

The Mountain Chief is owned by Mr. Gibson, and carries a four-inch vein of galena that mills 50 ounces of silver per ton. It is opened by a 60-foot shaft.

The Santa Fe is also located on Seaton mountain, and is opened by four shafts aggregating 195 feet and an adit 300 feet in length. It carries a vein of galena of an average width of four to six inches that mills 50 ounces in silver.

The Legal Tender lies on Franklin mountain and is opened by a shaft 70 feet deep. It carries a vein of galena that averages five inches in width and assays 150 ounces in silver.

The Horn Lode, on Seaton hill, owned by W. F. Horn, is one of the finest prospects in the county, considering the paucity of its developments. It is opened by a shaft 30 feet deep, showing a well-defined crevice and a pay-vein about a foot in width, consisting principally of galena and carrying gold and silver to the amount of \$90 per ton.



